

REMARKS

In the Office Action, the Examiner rejected claims 22, 23, 25-37, 39 and 41-58 under 35 U.S.C. 102 and/or 103. These rejections are fully traversed below.

Claim 34 has been amended. Claims 24, 46, and 56-59 have been cancelled. Claims 60-65 have been added. Thus, claims 22-23, 25-45, 47-55 and 60-65 are pending in the application. Reconsideration of the application is respectfully requested based on the following remarks.

Drawings

The formal drawings filed with the application already include the designation, —Prior Art—. If need be, a new set of formal drawings can be submitted.

Claim Rejections - 35 U.S.C. 102

Claims 48-52, 54 and 56-58 have been rejected under 35 U.S.C. 102(b) as being anticipated by *Ohmi* et al (WO 98/39500).

In brief, the present invention (especially with regards to independent claims 48 and 49) provides an impedance matching layer. The impedance matching layer is configured to help match the impedance between regions or zones of a pedestal that typically have different impedances. By matching the impedance of these zones, process uniformity is greatly improved. None of the cited references teach or suggest impedance matching let alone an impedance matching layer positioned between an edge ring and an electrode. With regards to *Ohmi*, the most that can be said is that *Ohmi* discloses a means for adjusting junction impedance 104. This however does not cover matching different impedances.

Claim 48

In contrast to *Ohmi*, claim 48 specifically requires, "...the second impedance being different than the first impedance..." While *Ohmi* may show one region including auxiliary electrode 102 and another region including base 108, *Ohmi* does not teach or suggest regions

having different impedances. *Ohmi* is completely silent to multiple zones having different impedances. Accordingly, the rejection is unsupported by the art and should be withdrawn.

Also in contrast to *Ohmi*, claim 48 specifically requires, "...an impedance matching layer configured to adjust the second impedance such that the second impedance is substantially equal to the first impedance..." While *Ohmi* may disclose a means for adjusting junction impedance 104, *Ohmi* does not teach or suggest that this means equalizes the impedance between multiple regions. Accordingly, the rejection is unsupported by the art and should be withdrawn.

Claims 49-54

Claim 49 (and therefore its dependents) has similar limitations as claim 48. For example, claim 49 includes "the first impedance being different than the second impedance," and "an impedance matching layer having characteristics configured to adjust the second impedance such that the second impedance is substantially equal to the first impedance..." Neither of which are taught in *Ohmi*. The rejection to claim 49 should be withdrawn for at least the same reasons given above.

Although the rejections to the dependent claims 50-54 should be withdrawn for at least the reasons as above, it should be noted that they offer additional language that is unsupported by the art. For example, claim 50 specifically requires, "wherein the first component is disposed below an inner region of the substrate and wherein the second component disposed below an outer region of the substrate when the substrate is positioned inside the process chamber for processing." *Ohmi* does not show any component disposed between electrode 101 and base 108, which is the surface that is subjected to processing (see Col. 5, lines 57-58). Although 101a is disposed below the base 108, it is still a portion of the electrode and therefore it does not constitute a component that produces a first impedance when energy is coupled therethrough as required by claim 49. Accordingly, the rejection is unsupported by the art and should be withdrawn.

Claims 56-58

Claims 56-58 have been cancelled in order to reduce the number of independent claims thereby expediting the prosecution of this case. The Applicant reserves the right to go after these claims at a later time as for example in a continuing application.

Note to the Examiner

With regards to the all the rejections mentioned above (and below), it should be noted that although the Examiner provided support for their rejection ("see, for example, figs. 1, 6A, 6B, 7B, 9, 26A-26I, and their descriptions"), the Applicant was unable to find any of the limitations described above in those sections. The Examiner is respectfully requested to provide a more detailed showing of these specific limitations in order to help the Applicant understand the rejections (thereby expediting the prosecution of this case).

Claims 22, 23, 25-31, 34-37, 39, 41-45 and 47-58 have been rejected under 35 U.S.C. 102(b) as being anticipated by *Masuda et al* (6,171,438).

Claims 22, 23 and 25-31

In contrast to *Masuda*, claim 22 (and its dependents) specifically requires, "...said impedance matching layer being bonded to said electrode or said edge ring..." First of all, *Masuda* does not teach or suggest an impedance matching layer (the Examiner is urged to specifically show where such language is described). Second, even if one considers the insulator 133 to be an impedance matching layer (which it is not), *Masuda* provides no evidence that the insulator 133 is bonded to the sample holder ring 132 or the electrode 130. *Masuda* simply does not teach or suggest such a feature. The most that can be said is that the sample holder ring is installed on top of the electrostatic chucking device (Col. 8, lines 58-59). The term "install" however is not synonymous with the term "bond." As stated in the specification of the present invention, "... the impedance matching layer is bonded on the corresponding surface (e.g., edge ring or electrode) to produce better thermal and electrical bonds. By way of example, a bonding process such as silicon elastomer works well." Accordingly, the rejection is unsupported by the art and should be withdrawn.

Although the rejections to the dependent claims 23, 25-31 should be withdrawn for at least the reasons as above, it should be noted that they offer additional language that is unsupported by the art. For example, in contrast to *Masuda*, claim 25 specifically requires, "...wherein said impedance matching layer is arranged to control said impedance between said electrode and said plasma at the edge of said substrate."

Claim 34-37, 39 and 41-45

The rejection is moot based on the amendment made above. Particularly, the limitations of claim 46 have been incorporated into claim 34 (see argument below).

Claim 48

In contrast to *Masuda*, claim 48 specifically requires, "...the second impedance being different than the first impedance..." and "...an impedance matching layer configured to adjust the second impedance such that the second impedance is substantially equal to the first impedance..." Like *Ohmi*, *Masuda* does not teach or suggest regions having different impedances or equalizing the impedance between multiple regions. This could not be found anywhere in the *Masuda* patent. The insulator 133 is simply not an impedance matching layer. Accordingly, the rejection is unsupported by the art and should be withdrawn.

Claims 49-54

Claim 49 has similar limitations as claim 48, as for example, "the first impedance being different than the second impedance," and "an impedance matching layer having characteristics configured to adjust the second impedance such that the second impedance is substantially equal to the first impedance..." The rejection to claim 49 should therefore be withdrawn for at least the same reasons as given above.

Claims 56-58

Claims 56-58 have been cancelled in order to reduce the number of independent claims thereby expediting the prosecution of this case. The Applicant reserves the right to go after these claims at a later time as for example in a continuing application.

Claims 22, 23, 25-31, 34-37, 39, 41-43 and 47-58 have been rejected under 35 U.S.C. 102(b) as being anticipated by *Wicker et al* (6,129,808).

Claims 22, 23 and 25-31

In contrast to *Wicker*, claim 22 (and its dependents) specifically requires, "... said impedance matching layer being bonded to said electrode or said edge ring..." First of all, *Wicker* does not teach or suggest an impedance matching layer (the Examiner is urged to specifically show where such language is described). Second, even if one considers the pedestal 112 to be an impedance matching layer (which it is not), *Wicker* provides no evidence that the pedestal 112 is bonded to the focus ring 114 or the electrode 110. Accordingly, the rejection is unsupported by the art and should be withdrawn.

Although the rejections to the dependent claims 23, 25-31 should be withdrawn for at least the reasons as above, it should be noted that they offer additional language that is unsupported by the art. For example, in contrast to *Wicker*, claim 25 specifically requires, "... wherein said impedance matching layer is arranged to control said impedance between said electrode and said plasma at the edge of said substrate."

Claim 34-37, 39 and 41-45

The rejection is moot based on the amendment made above. Particularly, the limitations of claim 46 have been incorporated into claim 34 (see arguments below).

Claim 48

In contrast to *Wicker*, claim 48 specifically requires, "... the second impedance being different than the first impedance..." and "... an impedance matching layer configured to adjust the second impedance such that the second impedance is substantially equal to the first impedance..." Like *Ohmi* and *Masuda*, *Wicker* does not teach or suggest regions having different impedances or equalizing the impedance between multiple regions. The pedestal 112 is simply not an impedance matching layer. Accordingly, the rejection is unsupported by the art and should be withdrawn.

Claims 49-54

Claim 49 has similar limitations as claim 48, as for example, "the first impedance being different than the second impedance," and "an impedance matching layer having characteristics configured to adjust the second impedance such that the second impedance is substantially equal to the first impedance..." The rejection to claim 49 should therefore be withdrawn for at least the same reasons.

Claims 56-58

Claims 56-58 have been cancelled in order to reduce the number of independent claims thereby expediting the prosecution of this case. The Applicant reserves the right to go after these claims at a later time as for example in a continuing application.

Claim Rejections - 35 U.S.C. 103

Claims 22, 23, 25-31, 34-37, 39, 41-43 and 47-58 have been rejected under 35 U.S.C. 103(a) as being unpatentable over *Tamura et al* (5,792,304) in view of *Ohmi*.

Claims 22, 23 and 25-31

In contrast to *Tamura* and *Ohmi*, claim 22 (and its dependents) specifically requires, "...said impedance matching layer being bonded to said electrode or said edge ring..." First of all, neither reference teaches or suggests an impedance matching layer. Second, even if one considers the means for adjusting junction impedance 104 in *Ohmi* to be an impedance matching layer (which it is not), *Ohmi* provides no evidence that the means 104 is bonded to the sample holder ring 132 or the electrode 130. *Ohmi* simply does not teach or suggest such a feature. The most that can be said is that the auxiliary electrode 102 containing locale electrode 103 and means 104 is joined to the electrode 101 via screw holes 111 and screws 112 (see Figures 1 and 2). Screwing however is not bonding. Accordingly, the rejection is unsupported by the art and should be withdrawn.

Claim 34-37, 39, 41-43 and 47

The rejection is moot based on the amendment made above. Particularly, the limitations of claim 46 have been incorporated into claim 34 (see arguments below).

Claims 48-55

Tamura does not overcome the deficiencies of *Ohmi* as described above with regards to these claims. As stated by the Examiner, *Tamura* does disclose an impedance matching layer and as argued above neither does *Ohmi*. More particularly, *Ohmi* does not disclose "...the second impedance being different than the first impedance..." and "...an impedance matching layer configured to adjust the second impedance such that the second impedance is substantially equal to the first impedance..." as required by claim 48, and "the first impedance being different than the second impedance," and "an impedance matching layer having characteristics configured to adjust the second impedance such that the second impedance is substantially equal to the first impedance..." as required by claim 49 (and its dependents). Accordingly the rejections are unsupported by the art and should be withdrawn.

Claims 56-58

Claims 56-58 have been cancelled in order to reduce the number of independent claims thereby expediting the prosecution of this case. The Applicant reserves the right to go after these claims at a later time as for example in a continuing application.

Claims 32-33 and 46 have been rejected under 35 U.S.C. 103(a) as being unpatentable over *Masuda*.

The Applicant disagrees with the Examiners assertion that *Masuda* discloses an impedance matching layer (especially an impedance matching layer with the limitations described in these claims). *Masuda* simply provides no evidence of a layer that helps match the impedance between regions or zones of a pedestal that typically have different impedances. As should be appreciated, different impedances produce electrical discontinuities, which lead to process variation across the substrate. The impedance matching layer in the present invention reduces these electrical discontinuities by matching the impedances and as a result process

variations found across the substrate are substantially reduced. As such, device yields are increased and more of the substrate can be used to create IC's.

Claim 32 spells out one embodiment that helps match the impedance across the substrate. In particular, the different dielectric constant of the impedance matching layer helps equalize the impedance formed between the chuck and substrate and the impedance formed between the edge ring and substrate (even in cases where the dielectric constants of the chuck and the edge ring are substantially similar). As should be appreciated, the differences in impedance may be caused by a chuck and edge ring having a different thickness or other layers of material, including for example air, found at the various interfaces between the different impedance layers. To cite an example from the specification of the present invention, "the dielectric constant is larger to compensate for the epoxy (e.g., increased impedance) that exists at the edge of the ceramic portion of the chuck. The epoxy is generally used to protect the chuck from a regional field (e.g., arcing)." *Masuda* simply does not teach or suggest such a limitation. Accordingly, the rejection is unsupported by the art and should be withdrawn.

Also in contrast to *Masuda*, claim 33, specifically requires, "...wherein a first impedance produced through said chuck is different than a second impedance produced through said edge ring, and wherein said impedance matching layer is arranged to adjust said second impedance produced through said edge ring so that said second impedance is substantially equal to said first impedance produced through said chuck." No such limitation is taught in *Masuda*. The Examiner is respectfully urged to precisely show where such a limitation is taught. The Applicant could find no such limitation in any of the material cited by the Examiner. This information would be greatly appreciated in order to help keep prosecution of this case moving forward.

With regards to claim 46 (which was cancelled and moved to claim 34), again it is emphasized that *Masuda* is completely silent to matching the impedance at various points across the substrate and therefore the rejection should be withdrawn. *Masuda* completely fails to teach or suggest, "...said impedance matching layer being configured to match the impedance between said electrode and said plasma at the edge of said substrate with the impedance between said electrode and said plasma at the center of said substrate" as required by claim 46 (which is now included in Claim 34). Up to this point, the Examiner has not provided any evidence of impedance matching. The Examiner is respectfully urged to show where in *Masuda* such a

limitation is taught. Accordingly, the rejection is unsupported by the art and should be withdrawn.

Claims 32-33 and 46 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Wicker.

These rejections should be withdrawn for at least the same reasons as given above with regards to *Masuda*. Like *Masuda*, *Wicker* fails to disclose impedance matching in a pedestal that supports a substrate.

Claims 44-45 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Tamura in view of Ohmi and further in view of Masuda.

Claims 44-45 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Wicker in view of Masuda.

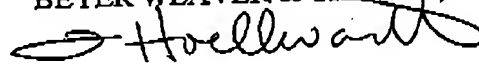
These rejections should be withdrawn for at least the same reasons as given above with regards to *Masuda*. None of these references teach or suggest impedance matching.

SUMMARY

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,

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